

## AMENDMENTS TO THE CLAIMS

This listing of claims replaces all previous versions, and listings, of claims pending in this application.

### Listing of Claims

#### Claims 1-10 (Canceled)

11. **(Previously presented)** A method for detecting the presence of target analytes, the method comprising:

providing an electrode comprising a self-assembled monolayer and an assay complex covalently attached to the electrode, the assay complex comprising a target analyte, a capture binding ligand and an electron transfer moiety;

applying an input waveform to the electrode, the input waveform illiciting a response of characteristic waveform from the electrode indicative of electron transfer between the electron transfer moiety and the electrode;

receiving an output waveform from the electrode, responsive to the input waveform;

analyzing the output waveform for the presence of the characteristic waveform.

12. **(Previously presented)** A method according to claim 11, wherein the act of analyzing the output waveform includes utilizing chronocoulometry.

13. **(Previously presented)** A method according to claim 11, wherein the act of analyzing the output waveform for presence of the characteristic waveform includes applying the output waveform to a digital lock-in amplifier.

14. **(Previously presented)** A method according to claim 11, wherein the act of analyzing the output waveform for presence of the characteristic waveform includes fitting the output waveform to the characteristic waveform.

15. **(Previously presented)** A method according to claim 14, wherein the act of fitting the output waveform to the characteristic waveform includes calculating an error between the characteristic waveform and the output waveform.

16. **(Previously presented)** A method according to claim 11, wherein the act of analyzing the output waveform for presence of the characteristic waveform includes determining a background signal and subtracting the background signal from the output waveform.

17. **(Previously presented)** A method according to claim 11 wherein the electron transfer moiety comprises a transition metal complex.

18. **(Previously presented)** A method according to claim 11 wherein the target analyte comprises a nucleic acid.

19. **(Previously presented)** A method according to claim 11 wherein the target analyte comprises a protein.

20. **(Previously presented)** A method according to claim 11 wherein the input waveform comprises at least a portion having a frequency of about 100 kHz.

21. **(Previously presented)** A method according to claim 11 wherein the input waveform is a voltage waveform and the output waveform is a current waveform.

22. **(Previously presented)** A method according to claim 11 wherein the characteristic waveform comprises a Gaussian waveform.

23. **(Previously presented)** A method according to claim 11 wherein the characteristic waveform comprises a modified Gaussian waveform.

24. **(Previously presented)** A method according to claim 11 further comprising: predicting the characteristic waveform, based at least on the electron transfer moiety.

25. **(Previously presented)** A method for detecting the presence of target analytes, the method comprising:

providing an electrode comprising a self-assembled monolayer and an assay complex covalently attached to the electrode, the assay complex comprising a target analyte, a capture binding ligand and an electron transfer moiety;

applying an input waveform to the electrode;

receiving an output waveform from the electrode, responsive to the input waveform;

analyzing the output waveform using chronocoulometry to identify electron transfer between the electron transfer moiety and the electrode.